In order to make cross sections of the germs and embryos thus extracted from the ovum, I leave them for some days in Müller's liquid, and colour them with picrocarminate of ammonia. After depriving them of water by treatment with alcohol of spec. grav. 0·828 and then with absolute alcohol, I put them for 24 hours into collodion. The embryo is then arranged upon a small slab of elder-pith soaked with alcohol, and covered with a layer of collodion. When the collodion has arrived at a suitable consistency, very thin sections may be made, including the embryo and the plate of pith; and these are to be preserved in glycerine.

This process is applicable to all sorts of embryos which are not very thick, so that they may be coloured *en masse*. It has the immense advantage of enabling one to see at what level in the embryo each section is made, to preserve each section in the midst of a transparent mass, which sustains all the parts and prevents their being damaged, as too often happens when an inclusory mass is employed from which the section must be freed before mounting.

In his 'Précis de Technique microscopique,' M. Mathias Duval has already recommended collodion in embryological researches, but without indicating his mode of employing it. We hope to be serviceable to embryologists by making known to them a process which they may find useful.—*Bull. Soc. Philom. Paris*, November 22, 1878.

On a Gigantic Isopod from the Great Depths of the Sea.

By M. A. Milne-Edwards.

The Government of the United States has repeatedly caused dredgings to be made in the American seas; and recently it commissioned Mr. Alexander Agassiz to explore the bed of the Gulf-stream in the Straits of Florida, between the southern point of that State and the island of Cuba. In December 1877 that naturalist embarked on board the steamer 'Blake,' and made a series of dredgings, some of which were carried nearly to 2000 fathoms, and brought up a considerable quantity of animals. Mr. Agassiz, with the consent of the administration of the Coast Survey of the United States, has sent me all the Crustacea collected during this cruise, and begged me to investigate them. The collection is very extensive and rich; it will furnish me with the materials for a memoir, of which I shall have the honour hereafter to communicate to the Academy the general results. At present I shall confine myself to calling attention to one of the most extraordinary animals for which I am indebted to Mr. Agassiz, namely a gigantic Isopod, dredged at 955 fathoms, to the north-east of the bank of Yucatan, north of the Tortugas *.

This Isopod, to which I have given the name of *Bathynomus giganteus*, is remarkable not only for its comparatively enormous

* See, on this subject, A. Agassiz, Letter No. 1 to C. P. Patterson, Sup. Coast Survey, on the dredging-operations of the U.S. Survey steamer 'Blake' during parts of January and February 1878 (Bull. Mus. Comp. Zool. Cambridge, vol. v. p. 4).

dimensions (it measures about 0·23 metre in length, by 0·10 metre in breadth), but also for the peculiar arrangement of its respiratory apparatus, which is very different from that of all other known crustaceans.

It would appear that the respiratory apparatus of an ordinary Isopod would have been insufficient to supply the physiological needs of the *Bathynomus*, and that the addition of special organs of greater functional power was necessary. The abdominal false feet, which usually in this group constitute alone the branchial apparatus, only form in *Bathynomus* a sort of opercular system, beneath which occur the true respiratory organs or branchiæ. The latter, considered individually, resemble little trees or tufts originating from stems, which divide again and again, and thus form a regular hairy tussock. When examined under the lens they are seen to form a certain number of distinct and more or less developed bundles; each of these bundles originates in a tubular peduncle with membranous and flexible walls, which soon furnishes other trunks; and these speedily divide into a quantity of elongated appendages, nearly similar, but arranged with no regularity, and having the appearance of a spindle with delicate walls.

If a coloured liquid be injected into the sinus situated at the base of the branchial feet, the whole of this system may be easily filled, and the progress of the liquid may be followed, not only into the branchial tree, but also into an irregular network hollowed out in the interior of each of the leaflets of the abdominal false feet, and comparable to the entire branchial apparatus of the ordinary Isopods. A marginal vessel seems to collect the blood which has respired, and pours it into the branchio-cardiac trunk.

In all Isopods, on the contrary, the abdominal false feet are very simple; and when they are complicated in order to fulfil the requirements of a more active respiration, this is effected by the folding (which is always rudimentary) of the posterior lamina of these limbs.

We know, however, two genera of Isopods in which ramose appendages appear on the sides of the body, namely the genera *Ione* and *Kepon* in the family Bopyridæ; but between this rudimentary apparatus and that of *Bathynomus* there are fundamental differences, not only in the position of the branchial tufts, but also in their structure &c.

In its general construction, the grouping of its segments, the composition of the parts of its mouth, and the arrangement of its legs, *Bathynomus* undoubtedly belongs to the division of the *Isopodes marcheurs*. It differs from the Sphæromidæ by its free abdominal segments and the development of its caudal fin. These peculiarities approximate it to the Cymothoadæ, and among these to the *Cymothoadiens errants*; but in the structure of the head, antennæ, and eyes it presents certain characters which separate it from all known groups. The eyes are greatly developed, in opposition to what might be expected in an animal living at so great a depth and in a very obscure medium; each of them is formed of about four thousand square facets; and instead of being placed upon the upper

surface of the head, as in all the errant Cymothoadæ, they occupy the lower surface and are placed beneath the frontal margin, on each side of the base of the antennæ.

In the form of the parts of the mouth *Bathynomus* approaches the *Cirolani* more than the other representatives of the same group; in the arrangement of its legs it presents rememblances to the above crustaceans and the genus *Ægya*. But the organic characters which I have indicated above seem to me to be sufficiently important to separate *Bathynomus* from all other Isopods, and to place it in a new group of the family Cymothoadæ, which I propose to name *Cymothoadiens branchifères.*—*Comptes Rendus*, January 6, 1879, p. 21.

On the Termination of the Visceral Arterioles of Arion rufus. By M. S. Jourdain.

The author remarks that anatomists do not appear to have attempted by direct observation to ascertain the mode in which the blood of the arteries in mollusks flows into the visceral cavity. He says that if a fragment of one of the organs contained in the central cavity be separated by a tangential section and placed under the microscope, and the outer surface examined with a power of 200–250 diameters, the last ramifications of the arteries, the diameter of which is variable, are seen all to reach the free surface of the organ, where they terminate suddenly by a truncated and gaping extremity. It is through these orifices, which are nearly always funnel-shaped, that the arterial blood passes into the general cavity. In *Arion* the parts need not be injected, as very clear results may be obtained without any such precaution, owing to the calcareous corpuscles, which incrust their walls as far as and including the free mouth. Similar orifices exist in many other Mollusca.

The author thinks that this arrangement was perceived by Alder and Hancock, although its true interpretation escaped them. Their pl. iv. fig. 10 shows a close resemblance to his own drawings of the arterial orifices. It represents an enlargement of a terminal vesicle of the accessory salivary gland in *Doto*, and shows tubes ramifying after the fashion of arteries, and terminating at bodies which the English anatomists called *nucleated cells*. These are the funnel-shaped orifices of the arterial capillaries of the gland. Alder and Hancock were struck with the fact that the vasculiform tubes exactly correspond in diameter with the "nuclei;" and they add in a note that the latter might be the apertures of small vessels.

The author thinks that the orifices of the supposed aquiferous vessels of the Acephala and other Mollusca are anatomically of the same nature as the arterial funnels described by him.—*Comptes Rendus*, January 27, 1879, p. 186.

The Eye in the Cephalopoda. By Prof. S. Richiardi.

The author remarked that anatomists of the present day, still accepting completely Cuvier's opinion, deny the existence in the eye of